the monsoons and the influence of the heat equator from these pages.

(5) "The Marlborough Country" should be as interesting to a tourist with a bent for geology, or archæology, or nature study, as it is useful to a teacher who wants to deduce from an ordnance map the immense amount of information which lies hidden beneath its signs and symbols. The Marlborough district map (sheet 266 of the one-inch ordnance survey map) is in this little book made to yield up as subject-matter for observation the reading of relief maps in general, the physical divisions of the "Marlborough Country," its geology, climate, farm life, communications, distribution of population, history and archæology, let alone such specialities as the Downs, the Vale of Pewsey, Savernake Forest, and a host of miscellanous local topics. The book is a novelty, and has more than a local interest. It is a pioneer, an exemplar, in the science of home geography.

Summarising generally, all five books are suitable for the middle and higher forms of a secondary school. No. 1 is well got up, of taking appearance, but rather sketchy, and inferior, in our opinion, to its "Oxford" rivals. No 2 must fill a great void in South Africa, but is naturally not so well adapted for British schools. Nos. 3 and 4 are on similar lines, and belong to the excellent type of book of which Simmons and Richardson's "Introduction to Practical Geography" was the first exponent. No. 5 has for its staple just the kind of information that a guide-book relegates to its introductory pages, and as for its interjectory questions—well, the ordinary man may ignore them, while the teacher will find them extremely useful.

LABORATORY CHEMISTRY.

(1) *Outlines of Inorganic Chemistry.* By Dr. E. B. Ludlan. Pp. xv+365. (London: Edward Arnold, 1911.) Price 4*s.* 6*d.*

(2) *A Handbook of Organic Analysis, Qualitative and Quantitative.* By Hans Thacher Clarke, with an introduction by Prof. Norman Collie, F.R.S. Pp. viii+264. (London: Edward Arnold, 1911.) Price 5*s.* net.

THE methods of teaching chemistry, particularly inorganic chemistry, are so diverse and depend so much upon the individuality of the teacher that it is no wonder there are a large number of books on elementary chemistry, and that their number is still increasing.

(1) Mr. Ludlan's book is very readable, and is illustrated with portraits of Lavoisier, Priestley, Scheele, Faraday, Dalton, and Humphry Davy. We like the introduction of such portraits in a book on science because it helps the student to remember historical facts, and impresses upon his memory the importance of the work of the persons whose portraits appear.

The author commences with a brief discussion on early notions which for many reasons, mainly for the want of the balance, were incorrect. The moral impressed is: "Be sure of your facts before trying to explain them." Some of the questions at the end of the chapters are unusual; for example, "How would you attempt to establish the truth or inaccuracy of the following statements: 'Sunshine puts the fire out'; 'Sunshine makes colours fade'; 'A watched kettle never boils'?" These questions may be suitable in a class, but are somewhat puerile in a book, more particularly as the chapter in question does not deal with them—it happens to be "On the Rusting of Iron." But anyone who works carefully through the book will obtain a good foundation of elementary chemistry.

(2) The second book is of a very different character, being on organic analysis. It is only fairly recently that books on organic analysis have been published in which any attempt has been made at classification. Of course, the difficulties of classifying substances of such diverse nature and properties as occur in organic chemistry are very great, and when all is said and done organic analysis is not in general so exact as inorganic analysis.

Prof. Collie, who writes an introduction to the book, remarks that "The examination of inorganic ions too often tends to degenerate into a series of arbitrary tests, memorised and applied without much consideration of their theoretical bearing." Some years ago, when everything was worked by the "chart," this was to some extent true, but the more modern books almost always insist most strongly on a mastery of the theoretical as well as the practical aspect. It is a strange fact that an organic chemist is apt to think lightly of inorganic chemistry and *vice versa,* and yet each branch has its own difficulties and importance.

The first chapter of the book before us deals with the preliminary investigation of the substance or substances to be analysed. Tests for purity, such as melting point, boiling point, and fractionation, are enumerated—we say enumerated instead of given, because the description is rather inadequate; for example, Distillation under reduced pressure: this is followed by tests for carbon and hydrogen and further preliminary tests with the object of sorting into groups such as phenolic, acidic, neutral, &c. The next chapter deals with the examination for radicles; it is well

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written, and the facts are grouped together in a very useful manner. The third chapter practically completes the qualitative portion of the book, and is followed by tables of organic compounds in which the properties and physical constants of a large number of the most generally met with organic compounds are compiled—it is, in fact, a short dictionary. This section will most certainly be found very useful in the laboratory, and has been very painstakingly compiled.

The rest of the book deals with quantitative analysis, combustions, nitrogen determinations, vapour densities, optical rotation, and other methods which are employed in the laboratory.

LOCAL AND GENERAL GEOLOGY.

(1) *Transactions of the Paisley Naturalists' Society.* Vol. i. Notes on the Mineralogy of Renfrewshire. By Robt. S. Houston. Pp. 88. (Paisley: Alexander Gardner, 1912.) Price 2*s.* 6*d.* net.

(2) *Physiography for High Schools.* By Albert L. Carey, Frank L. Bryant, William W. Clendenin, and William T. Morrey. Pp. vi+450. (Boston, New York, Chicago: D. C. Heath and Co.; London: George G. Harrap and Co., 1912.) Price 4*s.* 6*d.*

(3) *Structural and Field Geology. For Students of Pure and Applied Science.* By Prof. James Geikie, F.R.S. Third edition, revised. Pp. xxiv+452. (Edinburgh: Oliver and Boyd; London: Gurney and Jackson, 1912.) Price 12*s.* 6*d.* net.

(1) MR. HOUSTON'S volume, attractively produced and excellently printed, cannot fail to arouse interest in local mineralogy. A preface is given on the geology of Renfrewshire, and we are reminded of the famous specimens of prehnite and analcite from the Boylestone Quarry, near Barrhead. New analyses are given of several minerals, including phosphatic nodules (p. 72) from three localities, and a greenish kaolin (p. 71). The name "lithomarge" is misprinted in three places, and we do not like the term "carbonated" on p. 78 in place of "carbonised." But considerable care has evidently been given to the book, which serves as a model for the work of local naturalists.

(2) We now possess several good English books on physiography, and have received much stimulating aid from the United States. Hence it is questionable if another American work is likely to find a free place in our schools. Four high-school masters, however, have collaborated in New York City in producing a clearly written account of natural phenomena, illustrated with views and maps from the wide field available in the United States. Unlike Huxley, they set aside the biological aspects of physiography, and they omit in consequence a good deal that would interest a schoolboy in the surface-features of his country. The work is terse and lucid, but seems somewhat cold and uninspiring; its method of construction has prevented any one of the authors from impressing on it the mark of personality. A few good books of scientific travel would probably set young pupils thinking to far more purpose about the earth. Physical geography in the high-school stage already runs the risk of becoming stereotyped. Certain set names for phenomena require certain definitions. Meanwhile, the rock is removed out of its place and the waters wear the stones, while the eye of the pupil, made for wonder, remains fixed upon the printed page.

(3) Prof. James Geikie's "Structural and Field Geology" now reaches a third edition. In its fine use of full-page photographic plates it aims at accurate illustration of what will be encountered in the field. No one can convert these pictures into diagrams for the note-book; they are, as the author intends, direct encouragements to observe. Rocks are photographed from actual specimens, and the landscapes and field examples are largely derived from the series of views brought together by the Geological Survey. The book is a broad treatise on physical geology, written with a remarkable absence of technicalities. It goes, perhaps, too far in avoiding chemical considerations, such as those involved in the formation of laterite (p. 58) and cornstones (p. 70), and in omitting even chemical formulæ, which would be helpful in the description of the silicates. Methods of testing minerals and rocks are introduced as they happen to be required, and it is clear that the work should be read continuously. Among its best features are the drawings of block-models of faulted strata (pp. 162 and 166), which explain many of the puzzles of geological maps. The trough-faults in Fig. 53 might gain by a cross-reference to their explanation in Fig. 54.

The principles of geological surveying receive unusually full treatment, and attention is given to economic questions and to the broad characters of soils. Chapter xxv., on geological structure and surface features, might, of course, be greatly elaborated. The twenty-three lines devoted to coast-lines seem inadequate in comparison with forty-five pages given to ore-formations in chapter xvi., a subject not closely related to structural geology. Prof. James Geikie's book, so handsomely set before us, will long remain our best introduction to geological phenomena as they actually present themselves to the observer.

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